B.Tech. (EE) 3rd Semester (G-Scheme)
Examination, December–2025
ELECTRIC CIRCUIT ANALYSIS
Paper– PCC-EE-201-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: ***Question No. 1 is compulsory*** *and attempt four questions by selecting* ***one*** *question from each unit. All questions carry equal marks.*

1. (a) Explain concept of Duality.

   (b) Define reciprocity theorem w.r.t. two port network.

   (c) Write down the Properties of Hurwitz Polynomial.

   (d) Define Poles and Zeroes.

   (e) Mention different type of signals.

   (f) Define Z transform.

   (g) What do you mean by network synthesis?

   (h) Define Twig and Link.

   (i) Define Two Port network.

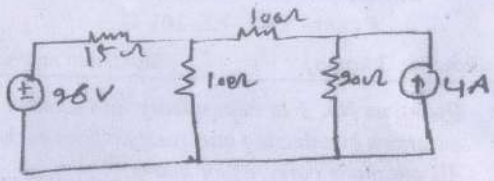
   (j) Define Steady state response.

Unit-I

2. (a) Differentiate Norton and Thevenin theorem.

   (b) Define and explain Compensation theorem.

3. Find out branch currents for following circuits using superposition theorem.



Unit-II

4. (a) Explain first order and second order system.

   (b) Define and explain steady state and transient response with neat sketch.

5. Explain solution of second order differential equation for RLC circuit.

Unit-III

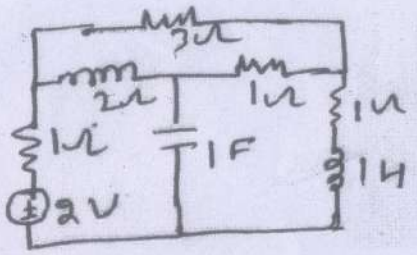
6. (a) Explain different methods for synthesis of RL admittances.

   (b) Define and explain PR function with its properties.

7. Determine the range of Beta such that the polynomial $P(S)=S^4+S^3+4S^2+s+3$ is Hurwitz.

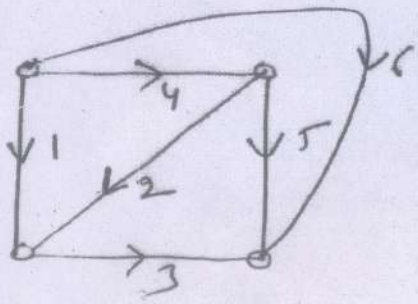
Unit-IV

8. (a) For the following network draw and write Tree and Cotree



   (b) Explain Cascade connection for two port network.

9. Prepare Tie set and cut set matrix for tree (2,4,6)



B.Tech. (EE) - 3rd Semester (G-Scheme)
Examination, December–2025
ANALOG ELECTRONICS
Paper– PCC-EE-205-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: ***Question No. 1 is compulsory.*** *Attempt* ***one*** *question from each section.*

1. (a) Write down the divide equation. 10×1.5=15

(b) Define rectification.

(c) What is load line concept?

(d) Differentiate between BJT and MOSFET.

(e) What is Non Inverting configuration of op-Amp?

(f) Define CMMR and PSSR.

(g) List out various feedback topologies.

(h) Define ADC.

(i) Define Active filter.

(j) Define offset error. 10×1.5=15

Section-A

2. (a) Explain the behaviour of P-N Junction at no bias, reverse bias and forward bias. Sketch V-I characteristics of P-N Junction. 8

   (b) Discuss the various types of clamping circuits. 7

3. Draw the circuit and working of Bridge rectifier. Also derive the expression for : 15

   (i) Ripple factor

   (ii) Efficiency

   (iii) DC current

   (iv) PIV

Section - B

4. (a) Explain the working and construction of Enhancement type MOSFET transistor. 8

   (b) Discuss the small signal model of MOSFET. 7

5. (a) Discuss the various types of Biasing circuits used in MOS Amplifiers. 10

   (b) Explain how MOSFET act as a switch. 5

Section-C

6. (a) Explain the various characteristics of Ideal OP-Amp. 7

   (b) Explain the working of Differential Amplifier. 8

7. (a) Discuss how the application of the feedback in Amplifier affects: 8

   (i) Stability of gain

   (ii) Bandwidth

   (iii) Noise

   (b) An Amplifier has an internal gain of 80; the harmonic distortion in output is 12%. To reduce the distortion within a tolerable limit of 3%. Calculate the feedback factor in the Amplifier. 7

Section-D

8. Explain the working of Op-Amp as : 15

   (i) Integrator

   (ii) Voltage regulator

   (iii) Instrumentation Amplifier

9. Explain how Op-Amp can be used of : 15

(i) Peak detector

(ii) Precision rectifier

(iii) Square wave generator

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Graph Paper

B.Tech. (EE) 3rd Semester (G-Scheme)
Examination, December–2025
ELECTRICAL MACHINES-I
Paper– PCC-EE-209-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all, selecting **one** question from each unit. **Question Number 1 is compulsory.** All questions carry equal marks.*

1. (a) Define mmf, reluctance, inductance, flux.

   (b) What is armature reaction? How armature reaction is minimised in dc machine?

   (c) Explain various losses in dc machines.

   (d) Derive the condition for maximum efficiency of transformer.

   (e) Draw the phasor diagram of transformer at resistive load.

   (f) What is meant by separately excited and self excited DC motor? 6×2.5 =15

Section-A

2. (a) Explain how magnetic fields is produced by a bar magnet and a current carrying coil. 7.5

   (b) State Ampere's law and Biot- Savart's law. 7.5

3. Discuss the concept of B-H curve. Explain with graph retentivity and coercivity of ferromagnetic material. 15

Section-B

4. (a) A shunt generator delivers 195A at terminal potential difference of 250 V. The armature resistance and shunt field resistance are .02 ohm and 50 ohm. The iron and frictional losses equal to 950 W. Evaluate emf generated, copper loss, electrical and mechanical efficiency. 7.5

   (b) Draw and explain speed -armature current, torque -armature current and speed- torque characteristics of dc series motor. 7.5

5. (a) A 8 pole, dc generator has wave wound armature contacting 32 coils of 6 turns each. Flux per pole is .06Wb. The machine is running at 250 rpm. Calculate the induced armature voltage. 7.5

   (b) Explain the construction feature of dc motor with suitable diagram. 7.5

Section-C

6. Draw and explain open circuit characters tics of dc generator. Explain condition for self excitation and cause of failure of build up voltage in dc machine. 15

7. Explain in detail Swinburne test for dc motor. Also formulate efficiency of motor and generator. 15

Section-D

8. A 10 kVA 2500/250 V single phase transformer gave following result

   OC Test: 230V, 5A, 60 W

   SC Test: 70V, 10 A, 80 W

   (a) Determine different parameters from OC and SC test.

   (b) Calculate voltage regulation of transformer at leading and lagging power factor.

   (c) Calculate efficiency of Transformer at half load and full load at unity power factor. 15

9. (a) Explain Scott connection for conversion of 3 phase to 2 phase in transformer. 7.5

   (b) Write a note on cooling of transformer. 7.5

Encl. Graph Paper

B.Tech. (EE) 3rd Semester (G-Scheme)
Examination, December–2025
MEASUREMENT AND INSTRUMENTATION
Paper– PCC-EE-210-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all. **Question Number 1 is compulsory**. Attempt **four** more questions from the sections A, B, C & D by selecting at least one question from each section.*

1. (a) Define the terms Sensitivity and Resolution.

(b) Define the term Transducer.

(c) Describe static errors in measuring Instruments

(d) Explain different classification of Instruments.

(e) Describe about Electrostatic type Instruments.

(f) Explain Shape of scale of PMMC instruments.

(g) What is Creep in energy meter?

(h) What are the disadvantages of moving iron instruments?

(i) What are the applications of Maxwell's Inductance-capacitance Bridge?

(j) What are the Limitations of Wheatstone bridge?

$10 \times 1.5 = 15$

Section-A

2. What are three forces in Electromechanical indicating instrument? Explain Comparison between gravity & spring controls. 15

3. (a) Draw Block diagram and working of CRO. 10

   (b) Explain with sketches the working principle of LVDT. 5

Section-B

4. How the range of DC ammeter and DC voltmeter can be extended? Derive the expression to find the shunt resistance and multiplier resistance? 15

5. Explain the construction and operating principle of permanent magnet moving coil instrument. Derive the expression for deflection of PMMC. 15

Section- C

6. Explain the construction and theory of a single-phase induction type energy meter. Show that number of revolutions in time t is proportional to energy supplied. 15

7. Explain the construction, operating principle, torque equation, advantages & disadvantages and errors of Single phase power factor meter. 15

Section- D

8. Write short note on: 15

   (a) Maxwell's Inductance Bridge

   (b) Hays Bridge

9. What are the difficulties in high resistance measurements? Explain Measurement of high resistance by direct deflection and loss of charge method. 15

B.Tech. (EE) 3rd Semester (G-Scheme)
Examination, December–2025
ENGINEERING MECHANICS
Paper– ESC-EE-202-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt five questions in all, selecting **one** question from each Section. **Question 1 is compulsory.** All questions carry equal marks.*

1. Write short notes on the following: 3×5=15

   (a) Polar moment of inertia

   (b) Rolling Coin

   (c) Concept of rigid body, velocity and acceleration

   (d) Gyroscopic effect

   (e) Coefficient of friction

Section - A

2. Explain Eigen values principal axis theorem in detail. 15

3. Explain Axis-angle formulation and Euler angles. 15

Section-B

4. Explain Newton-Euler's Law of rigid body motion in detail. 15

5. Find the Moment of inertia of a triangle about the base from first principles. 15

Section-C

6. Explain the General 3D motion equation in detail. 15

7. Explain modelling of typical supports and joints and discuss the kinematic and kinetic constraints they impose. 15

Section - D

8. Explain the relation of the Torsion of shaft with derivation. 15

9. Draw S.F.D. and B.M.D. for the cantilever beam carrying a point load at the free end. 15

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B.Tech. 3rd Semester G-Scheme
(Common for all branches)
Examination, December–2025
UNIVERSAL HUMAN VALUES-II
Understanding Harmony
Paper–MC-UHV-II

Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, selecting **one** from each unit. **Question No. 1 is compulsory.***

1. Answer the following questions briefly : 6×2½=15

(a) Why do we need values in life ?

(b) Explain 'technical skills and human values are complimentary'.

(c) What do you mean by Self-exploration ?

(d) Briefly explain 'Natural Acceptance'.

(e) Can we say prosperity is indicative of happiness ?

Unit–I

2. Write short notes on any two of the following : 2×7½=15

(i) Guidelines for value education

(ii) Experiential Validation

(iii) Advantages of self-exploration

3. What is right understanding ? Explain its benefits in modern life. 15

Unit–II

4. Define harmony. Explain the purpose of harmony in human life. 15

5. Differentiate between the activities of the self and the body. What is the role of self-discipline in regulating these activities? 15

Unit–III

6. Explain the role of justice in ensuring harmony in society. 15

7. What role do universal human values play in human relationship ? 15

Unit–IV

8. Elaborate the concept of respect. Why is giving respect important ? 15

9. Comment briefly on any two of the following : $2 \times 7\frac{1}{2} = 15$

   (i) Mutual fulfilment

   (ii) Co-existence of Human and Nature

   (iii) Holistic Perception of Harmony